

IN THE ABSTRACT:

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ABSTRACT

A single needle hemodiafiltration apparatus is provided. The single needle hemodiafiltration apparatus includes circuits for blood supply from a patient and blood return to a patient, a dialysis fluid supply system for supplying a dialysis fluid, and a system for controlling the blood flow and dialysis fluid flow in a separation device which is equipped to perform filtration and back-filtration operations. A controller is provided that controls, in a series of coordinated operations, the flow of blood from the patient into the separation device, the flow of filtration fluid and back filtration fluid, and the return of blood to the patient.